36. The process according to claim 29, wherein the metal substrate comprises a material selected from the group consisting of iron-nickel alloy, iron-nickel-cobalt alloy, steel 1.4767, steel 1.4541, steel 1.4571 and nickel.- -

Brand

REMARKS

Claims 29-36 are presently pending in the application.

By this Amendment, Applicants have added new claims 29-36 in order to more clearly state what Applicants consider to be their invention. Support for new claim 29 is found in canceled claims 23 and 27 as well as at page 5, lines 3-4 and lines 18-20 of the specification, for example. Support for new claims 30-33 can be found in canceled claims 24-26 and 28, respectively. Also, support for new claims 34-35 can be found in the specification at, for example, page 5, lines 3-6. Moreover, support for new claim 36 can be found in the specification at, for example, page 4, line 22 to page 5, line 2. The Examiner's claim rejections under 35 U.S.C. §112, second paragraph, are obviated by these amendments to the claims. No new matter has been added by the addition of new claims 29-36, and entry is respectfully requested.

The Examiner has rejected claim 23 under 35 U.S.C. §102 (b) as being anticipated by U.S. Patent No. 4,574,263 of Liddiard. The Examiner argues that Liddiard discloses a resistor-type detector and a process for making a detector wherein an insulated metal substrate is etched from the rear surface of the substrate to form holes for a recessed pattern through photographic artwork. The Examiner also argues the Liddiard discloses that the substrate has thin film contacts which establish the conductor path and further discloses that a wet etching is performed until an etching stop layer is reached. Claim 23 has been cancelled and therefore this rejection is moot.

The Examiner has rejected claims 24, 26, and 28 under 35 U.S.C. §103 (a) as being unpatentable over Liddiard. In support of this rejection, the Examiner makes the same arguments made with regard to the rejection of claim 23. Additionally, with regard to claim 24, the Examiner argues that it would have been obvious to impart a low thermal mass to the resistor or the detector because "all the process constituent[s] are similar and exposed and expected to have the same result. With regard to claim 26, the Examiner asserts that it would have been obvious to employ the membrane or etch stop layer in the metal substrate embodiment at any thickness since Liddiard discloses a thickness less than 0.05 μm (50 nm) for controlling the heat capacity of a heat sensitive layer (see claim 15) for the purpose of stopping an etchant or forming the conductive layer or for controlling the heat capacity. With regard to claim 26, the Examiner argues that Liddiard teaches that etched stop layer is applied by means of high vacuum thermal evaporation or a CVD process. Claims 24, 26 and 28 have been canceled and rewritten as new claims 30, 32 and 33, respectively, all of which depend from new claim 29.

The Examiner has also rejected claim 25 under §103 (a) as being unpatentable over Liddiard as applied to claims 24, 26, and 28, and further in view of U.S. Patent No. 4,436,593 of Osborne, et al. ("Osborne"). The Examiner acknowledges that Liddiard fails to teach spray etching with ferric chloride. However, the Examiner argues the Osborne teaches that ferric chloride can be used to etch efficiently and selectively with an etched stop. The Examiner concludes that it would have been obvious to one skilled in the art at the time of the invention to combine Osborne's teaching with Liddiard's method for selectively and efficiently etching the metal substrate as taught by Osborne. Claim 25 has been canceled and rewritten as new claim 31 which depends from new claim 29.

The Examiner has rejected claim 27 under §103 (a) as being unpatentable over Liddiard as applied to claim 23, and further in view of U.S. Patent No. 5,394,356 of Yang. The Examiner acknowledges that Liddiard fails to teach an etch stop layer comprising a material selected from the group consisting of titanium (Ti), platinum (Pt), nickel (Ni) and combinations thereof. However, the Examiner argues that Liddiard teaches a stop layer comprising silicon oxide and that Yang teaches that silicon oxide and titanium can be used as etch stop layers when etching of a conductive layer. The Examiner concludes that it would have bee n obvious to one skilled in the art at the time of the invention to combine Yang's teaching with the teachings of Liddiard because Yang teaches that titanium and silicon oxide are "functionally equivalent" when etching a conductive layer.

Claim 27 has been canceled. The elements of claim 27 have been combined with the elements of canceled claim 23 to form new claim 29. As a result, Applicants assert that the Examiner's rejections of claims 23-26 and 28 are moot and that new claim 29 is patantably distinct from the cited prior art for the reasons set forth below. Also, since new claims 30-36 depend from claim 29, these claims are also patantably distinct from the cited prior art. However, to the extent the rejection of claim 27 can be applied to new claim 29, Applicants respectfully but strenuously traverse the rejection of claim 27 and the arguments in support thereof for the reasons set forth in detail below.

The Examiner has acknowledged that Liddiard fails to teach an etch stop layer comprising a material selected from the group consisting of Ti, Pt, Ni and combinations thereof. However, Applicants also point out that Liddiard discloses an infrared radiation detector with an ultra thin metal film on a dielectric or semi-conductor pellicle, wherein the pellicle is located on a metal substrate (see, Liddiard, claim 1; see also, col. 4, lns. 19-25). The detector is the

resistance bolometer type that absorbs infrared radiation which raises the temperature of the detector thereby causing the electrical resistance to change (col. 1, lns. 14-17). The pellicle is described as being aluminum oxide, silicon dioxide, silicon monoxide, cryolite, germanium or silicon (col. 4, lns. 21-22). However, Liddiard does not disclose an additional metal etching stop layer made of Ti, Pt, Ni or combinations thereof deposited between a metal substrate and an electrically insulating surface of the metal substrate as recited in claim 29 of the present application (claim 29). Thus, Liddiard does not disclose a temperature-dependent measuring resistor according to the process for manufacturing as recited in new claim 29 of the present application. Therefore, Liddiard does not teach or suggest all of the elements of the claimed invention.

Applicants have found that during heating or cooling a measuring resistor without an additional metal etching layer that the electrically insulating layer breaks because of the different coefficients of thermal expansion of the metal substrate and the electrically insulating layer. However, the addition of a metal etching stop layer made of Ti, Pt, Ni or combinations thereof between the metal substrate and the electrically insulating layer of the metal substrate, as recited in the presently claimed invention, reduces failure of the measuring resistor during extreme heating or cooling. This is believed to be caused by the ductility of the additional metal etching stop layer, and is neither anticipated by or obvious in view of the cited prior art.

Yang discloses a process for forming an FET read only memory device and not a process for manufacturing a temperature-dependant measuring resistance with low mass according to the present application. Therefore, Yang is not related art. Notwithstanding, Yang describes a lower blanket layer 34 of polysilicon or polycide which is deposited under an intermediate blanket layer 36 (col. 3, lns. 9-10 and ln. 19; see also, claim 1). The intermediate,

blanket layer 36 can be formed of thermal silicon oxide, CVD silicon oxide, CVD silicon nitride, titanium, titanium nitride, titanium/tungsten, or the like and is etch resistant to an etch for polysilicon (see col. 3, lns. 19-25; see also, claim 1). Yang also discloses an overlying blanket or upper layer of polysilicon or polycide (see col. 3, lns. 27-33; see also, claim 1). However, Yang does not teach or suggest an additional metal etch stop layer as recited in claim 29 of the present application.

Further, there is no motivation to combine Liddiard and Yang as suggested by the Examiner since Liddiard discloses an infrared radiation detector and Yang discloses a process for forming an FET read only memory device, which are clearly unrelated art. Moreover, there is no reasonable expectation of success by combining Liddiard and Yang as suggested by the Examiner to include an additional metal etch stop layer as recited in claim 29. Both Liddiard and Yang teach away from an additional metal etch stop layer by teaching the use of, for example, an aluminum oxide or silicon oxide pellicle (see Liddiard, col. 4, ln. 21) and the use of, for example, a silicon oxide blanket layer (see, Yang, col. 3, lns. 23-24). Since these materials are appropriate etch stop materials for $FeCl_3$, there is no need for an additional metal etch stop layer as recited in claim 29 (see specification, page 6, lns. 3-4). Thus, the combination of Liddiard and Yang does not teach or suggest the use of an additional metal etch stop layer and, as a result, these prior art references do not anticipate the claimed invention.

The claimed invention is thus not obvious over Liddiard in view of Yang for all the reasons stated above. Besides, even if *prima facie* obviousness could be shown based on the combination of these references, such *prima facie* obviousness is sufficiently overcome by Applicants' improved and unexpected results as explained above and further stated in the specification of the application.

In view of the forgoing amendments, Applicants submit that the pending claims comply with the requirements of §112. In view of the foregoing remarks, the claims are patentably distinct from the cited prior art. Accordingly, reconsideration and withdrawal of the rejections, and an early Notice of Allowance, are respectfully requested.

Respectfully submitted,

KARLHEINZ WIENAND

3/5/03 By: Will C. Youngblood
(Date)

WILLIAM C. YOUNGBLOOD
Registration No. 50,524
AKIN, GUMP, STRAUSS, HAUER & FELD, L.L.P.
One Commerce Square
2005 Market Street - 22nd Floor
Philadelphia, PA 19103-7086
Telephone: (215) 965-1200
Direct Dial: (215) 965-1246
Facsimile: (215) 965-1210
E-Mail: wyoungblood@akingump.com

WWS:WCY:eas
Enclosures